

# Advanced SQL Concepts

CTE

RECURSIVE CTE

MATERIALIZED VIEWS

PIVOT & UNPIVOT

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# Common Table Expression (CTE)

- ▶ Temporary result set for complex queries
- ▶ Improves readability & reusability
- ▶ Example:

```
With Sales_CTE AS (  
  Select ProductID, Sum(SalesAmount) as TotalSales  
  From Sales group By ProductID )  
Select * From Sales_CTE Where TotalSales > 5000;
```

# Recursive CTE

- ▶ Used for hierarchical or recursive data
- ▶ Common in employee-manager, folder structures

- ▶ Example:

```
With Recursive EmpHierarchy as (  
  Select EmpID, EmpName, ManagerID From  
  Employees where ManagerID Is Null  
  Union All  
  Select e.EmpID, e.EmpName, e.ManagerID  
  From Employees e inner Join EmpHierarchy h on  
  e.ManagerID = h.EmpID )  
Select * From EmpHierarchy;
```

# Materialized Views

4

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- ▶ Stores the result of a query physically
- ▶ Improves performance (faster than normal views)
- ▶ Needs refresh to update with latest data
- ▶ Example:  
Create Materialized Views Sales\_Summary as  
Select Region, Sum(SalesAmount) as TotalSales  
From Sales Group By Region;

# Pivot & Unpivot

5

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- ▶ Pivot → Rows to Columns
- ▶ Unpivot → Columns to Rows
- ▶ Example (Pivot):  
`Select ProductID, Sum(Case when Year=2023  
Then SalesAmount End) AS Sales_2023 From  
Sales Group by ProductID;`
- ▶ Example (Unpivot):  
`Select ProductID, Year, SalesAmount From  
Sales_Unpivot Unpivot (SalesAmount For Year  
in (Sales_2023, Sales_2024)) as unpvt;`